
Glossary

Following are definitions of the terms used in this publication.

Public network facilities

PBX central office trunk

PBX central office (CO) trunks connect the PBX switch to the central office serving the PBX location. The trunks appear as station lines at the central office equipment.

Foreign Exchange Trunk

A Foreign Exchange (FEX) trunk provides a direct connection between a PBX switch and a remote central office other than the central office that serves the location of the PBX.

Wide area transmission service

Wide area transmission service (WATS) provides a bulk-rate service for incoming or outgoing toll calls within selected geographical regions (bands). A WATS trunk must terminate on a central office equipped to provide WATS, which may be the office that would normally serve that customer or may be a remote central office.

— Outgoing WATS

An outgoing WATS (OUTWATS) trunk is used exclusively for outgoing bulk-rate calls from a customer's PBX to a defined geographical area via the toll network.

— Incoming WATS

An incoming WATS (INWATS) trunk is used exclusively for incoming calls from a defined geographical area to a customer's PBX.

2-wire facility

A 2-wire facility is characterized by supporting transmission in two directions simultaneously, where the only method of separating the two signals is by the propagation directions. Impedance mismatches cause signal energy passing in each direction to mix with the signal passing in the opposite direction.

4-wire facility

A 4-wire facility supports transmission in two directions, but isolates the signals by frequency division, time division, space division, or other techniques that enable reflections to occur without causing the signals to mix together. A facility is also called 4-wire if its interfaces to other equipment meet this 4-wire criteria (even if 2-wire facilities are used internally), as long as crosstalk between the two transmission directions, as measured at the interface, is negligible.

PBX types

Main PBX

A main PBX is one which has a Directory Number (DN) and can connect PBX stations to the public network for both incoming and outgoing calls. A main PBX can have an associated satellite PBX, and can be part of a tandem tie trunk network (TTTN). If the main PBX provides tandem switching for tie trunks, it is called a tandem PBX. In the context of ESN, a main PBX has tie trunks to only one node.

Satellite PBX

A satellite PBX has no direct incoming connection from the public network. All incoming calls are routed from an associated main PBX over tie trunks. This definition places no restrictions on the handling of outgoing calls from the satellite PBX. A satellite PBX can have one-way outgoing trunks to the central office, in addition to outgoing service on trunks to the main PBX. In the context of ESN, a satellite PBX has no direct trunks to a node; however, calls to the node can be made through the main PBX.

Tributary PBX

The only difference between a satellite and a tributary PBX is that the tributary PBX has a direct incoming connection from the public network.

Tandem PBX

In addition to its usual PBX functions a tandem PBX is used as an intermediate switching point in a tandem tie trunk network (TTTN) to connect tie trunks together.

ESN node PBX

An ESN node PBX is a Meridian 1 system equipped with the node software package of ESN. It performs tandem switching with software-controlled alternate route selection to bypass busy trunk groups.

ESN main PBX

An ESN main PBX is a Meridian 1 switch with the ESN main software package. It performs tandem switching between a node and the main's satellite and tributary switches. An ESN main PBX has outgoing tie trunks to only one node.

PBX networks**Tandem tie trunk network**

A tandem tie trunk network (TTTN) is a switched customer network that uses tie trunks to interconnect PBX switches in different locations. Calls are routed between the switches by progressive dialing of access codes.

Common Control Switching Arrangement

A Common Control Switching Arrangement (CCSA) is a Bell system offering that divides equipment between PBX switches and tandem switches. The tandem switches are located on telco premises and perform only a tandem switching function. A user makes network calls at a PBX switch by dialing an access code (typically the digit 8), which connects the user to the telco tandem switch. The user then dials a seven digit number to reach the desired telephone at another connected switch. Routing between tandem switches is performed under common control.

Electronic Switched Network

An Electronic Switched Network (ESN) is a Northern Telecom private network offering with a dialing plan similar to that used in a CCSA. However, tandem switching functions are performed by PBX switches located on the customer's premises. Fewer restrictions on tie trunk routes are required by ESN than by the CCSA. CCSA requires that at least two tie trunks be connected in tandem to route a call between a pair of PBX switches. ESN uses one tie trunk to perform the same routing wherever there is sufficient traffic to justify the route.

Transmission level point

As an analog signal passes over a transmission facility, it encounters gains and losses that are part of the facility design and net out to zero. For example, a facility that uses a cable may have loss in the cable and may compensate for this loss by gain in one or more amplifiers. On the other hand, some losses are introduced to improve grade of service and are not recovered. The term *transmission level point* (TLP) is used to discriminate a gain or loss that is recovered from one that is not.

TLP requires the definition of a point in a transmission system as a reference level. Once this point is defined, the reference levels at other points can be derived. For example, the input to a transmission system might be defined as a -2 TLP. Assume that the signal passes through a 10 dB amplifier that compensates for loss elsewhere. The output of the amplifier is at a +8 TLP([-2] + [+10]). A -10 dBm signal at the input will be 0 dBm at the output. The same signal is -8 dBm0 (8 dB below the reference level) at the system input. It is also -8 dBm0 at the amplifier output. The signal has the same level, referenced by the TLP, because the gain in this case is offset by loss elsewhere and does not show up as gain or loss at the signal destination.

A second example is a transmission system with a 2 dB deliberate loss. The input and output TLPs are -2. A signal in at -10 dBm is -8 dBm0. The signal leaves the system with a level of -12 dBm, or -10 dBm0. The difference in level, even though the TLP is the same, is the loss introduced deliberately in the facility.

Two-wire and four-wire trunks in PBX networks are usually -2 TLP. However, some 4-wire trunks have a -16 TLP at the facility input and a $+7$ TLP at the facility output. If the trunk has a 0 dB loss, an input signal of -26 dBm (-10 dBm₀) is received at a level of -3 dBm (23 dB gain), which is also -10 dBm₀. Thus, loss elsewhere in the connection cancels out the 23 dB in the facility.

Meridian 1

Electronic Switched Network

Transmission guidelines

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